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EXAMINER	
ABOAGYE, MICHAEL	
ART UNIT	PAPER NUMBER
1793	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/711,786	HENRIKSON, PER	
	Examiner	Art Unit	
	MICHAEL ABOAGYE	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 June 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-34 and 56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-34 and 56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of claims

1. Claims 37 and 39-55 have been cancelled, hence claims 17-34 and 56 are pending in the application.

Means-Plus-Function Language

2. A claim limitation will be presumed to invoke 35 U.S.C. 112, sixth paragraph, if it meets the following 3-prong analysis:

(A) The claim limitations must use the phrase “means for” or “step for;”

(B) The “means for” or “step for” must be modified by functional language; and

(C) The phrase “means for” or “step for” must not be modified by sufficient Structure, material, or acts for achieving the specified function. (MPEP 2181)

Claim 17 state “image-analyzing means for analyzing a reproduction image". This limitation satisfies the 3-prong analysis and therefore properly invokes 35 U.S.C 112 6th. The image-analyzing means for analyzing a reproduction image is disclosed in the specification as being a program code or software para [59]).

Claim 17 state "means for reproducing the welding area." This limitation satisfies the 3-prong analysis and therefore properly invokes 35 U.S.C 112 6th. The means for reproducing is disclosed in the specification as being a camera, such as CCD or CMOS [para 29]

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 17-26 and 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson (US Patent No. 4943702) in view of Kovacevic et al. (US Patent No. 5,481,085).

Regarding claim 17, Richardson teaches an arrangement (see, figure 37) for real-time control of a welding operation that utilizes a welding head (1562, figure 37), said arrangement comprising: a device for monitoring a welding area of an object (see, workpieces 1567 and 1566, figure 37) during welding, said device comprising means for reproducing (equated to a video camera positioned at the image plane 1590, figure 37, also see, column 104, lines 10-20) the welding area; at least one filter (1592, figure 37) arranged in front of or in the reproducing means (see, filter 1592, placed in front of the image plane carrying the video camera in figure 37); and a laser light or radiation source (1576, figure 37 and column 103, line 58-column 104, line 25), other than said welding head (1592) that is configured and disposed so as to illuminate the welding area with laser light/radiation (1574, figure 37) having at least one predetermined light wavelength when the welding operation is being performed; wherein said filter (1592, figure 37) comprises a band-pass filter (see, column 104, lines 15-25) configured for filtering around a predetermined ultraviolet wavelength (see, column 10,

lines 28-40, note Richardson is not specific about illuminating the weld area with ultraviolet radiation, however the filter used is configured to filter around ultraviolet wavelength); a CPU-based device (see figure 4 , column 4, lines 30-40 and column 125, lines 10-15) having installed thereon image-analyzing means (equated to the built in software in the CPU/computer base device, see, abstract, and column 105, line 65- column 106, line 52) for processing analyzing a reproduction image of the welding area produced by the reproducing means (see, abstract, column 4, lines 30-40 , column 104, lines 37-45); and means a controller (see, column 25, lines 17-25, column 26, lines 13-22) that receives information based on analysis of the reproduction image that has been performed by the image-analyzing means and that controls at least one welding parameter and/or the position of the welding head on the basis of said information (see, column 80, line 65- column 81, line 30).

Richardson does not specifically teach a source of ultraviolet radiation configured and disposed so as to illuminate the weld area with ultraviolet radiation.

Kovacevic et al. teaches using UV laser source with wavelength of ultraviolet wavelength for illuminating welding area because at those wavelengths interference from the weld arc and background sources is minimized (column 3, line 62-column 4, line 3). It should also be noted that the examiner is not relying on the entire invention of Kovacevic but only on him being evidence that use of UV laser is known in the art (the benefits of such a laser being independent of the use of a diffuser and grid, as taught by Kovacevic).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the arrangement of Richardson to use a laser that emits light in the near-ultraviolet wavelength range to illuminate and monitor the weld area as taught by Kovacevic et al. since within said optical wavelength range, interference from the weld head and back-ground source which may affect the responses from the weld area is minimized (see, Kovacevic et al., column 3, line 62-column 4, line 3).

Regarding claim 18, Richardson teaches an image-analyzing means that is adapted to measure weld width from the reproduction image (see, column 5, lines 7-33, and lines 60-67).

Regarding claim 19, Richardson teaches an image-analyzing means that is adapted to detect at least one of the position of a welding joint, a gap between two parts to be welded together, and geometry of a weld melt (see, column 5, lines 7-33, and lines 60-67).

Regarding claim 20, Richardson teaches a method for monitoring a welding area of an object (see, workpieces 1567 and 1566, figure 37) during a welding process that utilizes a welding head (1562, figure 37), said method comprising: during said welding process, illuminating the welding area with laser light/radiation (1574, figure 37) of a predetermined light/radiation wavelength by means of a source (laser source, 1576, figure 37) other than said welding head (1562, figure 37); using a means for reproducing (equated to a video camera positioned at the image plane 1590, figure 37, also see, column 104, lines 10-20), reproducing the welding area while it is being welded (the process of figure 37 illustrates such); and filtering radiation from the welding area in a

direction toward said means for reproducing (figure 37, shows such), said filtering being carried out using a band-pass filter (1592, comprises a band-pass filter see, figure 37 and column 104, lines 15-25) around the predetermined ultraviolet wavelength(see, column 10, lines 28-40, note Richardson is note specific about illuminating the weld area with ultraviolet radiation, however the filter used is configures to filter around ultraviolet wavelength).

Richardson does not specific teach illuminating the weld area with ultraviolet radiation.

Kovacevic et al. teaches using UV laser source with wavelength of ultraviolet wavelength for illuminating welding area because at those wavelengths interference from the weld arc and background sources is minimized (column 3, line 62-column 4, line 3). It should also be noted that the examiner is not relying on the entire invention of Kovacevic but only on him being evidence that use of UV laser is known in the art (the benefits of such a laser being independent of the use of a diffuser and grid, as taught by Kovacevic).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the arrangement of Richardson to use a laser that emits light in the near-ultraviolet wavelength range to illuminate and monitor the weld area as taught by Kovacevic et al. since within said optical wavelength range, interference from the weld head and back-ground source which may affect the responses from the weld area is minimized (see, Kovacevic et al., column 3, line 62-column 4, line 3).

Regarding claims 21-24, Richardson fails to specifically teach the said claimed band filtering ranges. Kovacevic et al. teaches a predetermined wave length of about 337 nm (column 4, line 1). Kovacevic et al. also indicates that said predetermined wavelength range is preferred, since interference from the weld head and the background sources is effectively minimized (Kovacevic et al., column 3, line 62-column 4, line 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Richardson to use ultraviolet radiation of predetermined wavelength of about 337 nm as taught by Kovacevic et al. since within said predetermined wavelength range the interference from the weld head and the background sources is effectively minimized (Kovacevic et al., column 3, line 62-column 4, line 3)

Regarding claims 25-26, Richardson. as modified by Kovacevic et al. teach a predetermined wave length of about 337 nm. Though Kovacevic et al. does not teach the exact wavelength recited in these claims, however it has been held that , a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), See MPEP 2144.05.

Regarding claim 31, Richardson teaches using analyzing means (the software inbuilt in the CPU); said analyzing means, analyzing a reproduction image of the welding area produced by the reproducing means; and controlling at least one of

welding parameters and welding parameter and/or the position of said welding head based on information obtained from said analyzing said reproduction image (see, column 52, line 24-column 53, line 25, column 80, line 65- column 81, line 30).

Regarding claim 32, Richardson teaches measuring a width of a reproduced welding joint by said image analyzing mean, and at least one welding parameter and/or the position of said welding head that is/are controlled on the basis of the measured weld width (see, column 5, lines 7-33, and lines 60-67).

Regarding claim 33, Richardson teaches comparing a measured weld width is with one or more reference values and, in the event of deviation from an approved range being detected, and at least one welding parameter and/or the position of said welding head that is/are adjusted (column 11,lines 5-20, column 97, lines 44-64). Kovacevic et al. also teaches a feedback system included in the control which allows the acquired data by the imaging system to be compared with the reference or predetermined values and effecting the necessary adjustments to enhance the overall weld quality (see, Kovacevic et al. column 3, lines 20-31). Therefore Richardson and Kovacevic et al. either taken individually or as combined meet the limitation of claim 33.

Regarding claim 34, Richardson teaches comparing a measuring weld width and with one or more reference values and, in the event of deviation from an approved range being detected, and at least one welding parameter and/or the position of said welding head that is/are adjusted(column 11,lines 5-20, column 97, lines 44-64). Kovacevic et al. on the other hand teaches welding two workpieces (w1 and w2, figure1); providing an image means for detecting the length, width, depth, sag or

depression and the overall outline of the weld pool, and controlling at least one of welding parameters and the position of said welding head based on information obtained from the processed reproduction image (Kovacevic et al., column 3, lines 20-31). Note the Kovacevic et al. does not used the word gap, however, it is the examiner's position that dimension such the width recited by Kovacevic et al. would also define the gap between the two workpieces at the weld area. Therefore Richardson and Kovacevic et al. either taken individually or as combined meet the limitation of claim 34.

5. Claims 27-30 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson (US Patent No. 4943702) in view of Kovacevic et al. (US Patent No. 5,481,085) as applied to claim 20 above and further in view of Justice et al. (US Patent No. 4225771).

Regarding claims 27-30, Richardson and Kovacevic et al. combined teach band-pass filtering around a predetermined wavelength, fail to disclose the band-pass-filter range as set forth in these claims.

Justice et al. teaches a method and apparatus for monitoring a welding area by illuminating said welding area with a monochromatic light of predetermined wavelength from a source (10, figure 1); using a means (24, figure 1) for reproduction, reproducing the welding area while it is being welded; and using a narrow band filter (22, figure 1) for filtering the radiation from the welding area in a direction toward said means (24) for reproduction (see, Justice et al., abstract); wherein band pass filter is selected to match or commensurate with the predetermined wavelength of the illuminating monochromatic

light so that the reflected monochromatic radiation from the weld area will pass through the band pass filter to the reproducing means with negligible attenuation (see, Justice et al., column 2, lines 15-50).Justice et al. also teaches illuminating the weld area with monochromatic light source of wavelength of about 400-700 Nm and using a narrow band filter adapted for filtering a band width as small as about 10 nm (see, Justice et al. , column 2, lines 29-40). Though Justice et al. does not teach the exact band filter width (i.e. FWHM) recited in these claims, however it has been held that, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), See MPEP 2144.05.

It would have been obvious to one of ordinary skill to one or ordinary skill in the art at the time of the invention to modify the method of Richardson and Kovacevic et al. to use band pass filter that matches or commensurate with the predetermined wavelength of the illuminating ultraviolet light as taught by Justice et al. so that the reflected monochromatic radiation from the weld area would be able to pass through the band pass filter to the reproducing means with negligible attenuation (see, Justice et al., column 2, lines 15-50).

Regarding claim 56, Richardson teaches a method for monitoring a welding area of an object (see, workpieces 1567 and 1566, figure 37) during a welding process that utilizes a welding head(1562, figure 37), said method comprising: during said welding process, illuminating the welding area with laser light/radiation (1574, figure 37) of a

predetermined light/radiation wavelength by means of a source (laser source, 1576, figure 37) other than said welding head (1562, figure 37); using a means for reproducing (equated to a video camera positioned at the image plane 1590, figure 37, also see, column 104, lines 10-20), reproducing the welding area while it is being welded (the process of figure 37 illustrates such); and filtering radiation from the welding area in a direction toward said means for reproducing (figure 37, shows such), said filtering being carried out using a band-pass filter (1592, comprises a band-pass filter see, figure 37 and column 104, lines 15-25) around the predetermined ultraviolet wavelength(see, column 10, lines 28-40, note Richardson is not specific about illuminating the weld area with ultraviolet radiation, however the filter used is configured to filter around ultraviolet wavelength).

Richardson does not specifically teach illuminating the weld area with ultraviolet radiation.

Kovacevic et al. teaches using UV laser source with wavelength of ultraviolet wavelength for illuminating welding area because at those wavelengths interference from the weld arc and background sources is minimized (column 3, line 62-column 4, line 3). It should also be noted that the examiner is not relying on the entire invention of Kovacevic but only on him being evidence that use of UV laser is known in the art (the benefits of such a laser being independent of the use of a diffuser and grid, as taught by Kovacevic).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the arrangement of Richardson to use a laser that emits light in the

near-ultraviolet wavelength range to illuminate and monitor the weld area as taught by Kovacevic et al. since within said optical wavelength range, interference from the weld head and back-ground source which may affect the responses from the weld area is minimized (see, Kovacevic et al., column 3, line 62-column 4, line 3).

Richardson and Kovacevic et al. combined teach band-pass filtering around a predetermined wavelength, but fail to disclose the band-pass-filter range as set forth in these claims.

Justice et al. teaches a method and apparatus for monitoring a welding area by illuminating said welding area with a monochromatic light of predetermined wavelength from a source (10, figure 1); using a means (24, figure 1) for reproduction, reproducing the welding area while it is being welded; and using a narrow band filter (22, figure 1) for filtering the radiation from the welding area in a direction toward said means (24) for reproduction (see, Justice et al., abstract); wherein band pass filter is selected to match or commensurate with the predetermined wavelength of the illuminating monochromatic light so that the reflected monochromatic radiation from the weld area will pass through the band pass filter to the reproducing means with negligible attenuation (see, Justice et al., column 2, lines 15-50).Justice et al. also teaches illuminating the weld area with monochromatic light source of wavelength of about 400-700 Nm and using a narrow band filter adapted for filtering a band width as small as about 10 nm (see, Justice et al. , column 2, lines 29-40). Though Justice et al. does not teach the exact band filter width (i.e. FWHM) recited in these claims, however it has been held that, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but

are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), See MPEP 2144.05.

It would have been obvious to one of ordinary skill to one or ordinary skill in the art at the time of the invention to modify the method of Richardson and Kovacevic et al. to use band pass filter that matches or commensurate with the predetermined wavelength of the illuminating ultraviolet light as taught by Justice et al. so that the reflected monochromatic radiation from the weld area would be able to pass through the band pass filter to the reproducing means with negligible attenuation (see, Justice et al., column 2, lines 15-50).

Response to Arguments

7. Applicant's arguments with respect to claim17-34 and 56 have been considered but are moot in view of the new ground(s) of rejection. The new reference to Richardson teaches a CPU-based device computer means having installed thereon image-analyzing means in a form of software for analyzing a reproduction image of the welding area produced by the reproduction reproducing means.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL ABOAGYE whose telephone number is (571)272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. A./
Examiner, Art Unit 1793

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 1793